Virginia Department of Health
Tularemia: Overview for Healthcare Providers

Organism	*Francisella tularensis*: gram-negative bacteria that are small, aerobic, nonspore-forming coccobacilli. Multiple strains have been recognized.
Reporting to Public Health	Suspected or confirmed cases require immediate notification to the local health department (LHD). See http://www.vdh.virginia.gov/local-health-districts/
Infectious Dose	Very low: 10 bacteria when injected subcutaneously and 25 when aerosolized
Occurrence	Occurs throughout North America and in many parts of continental Europe, Russia, China and Japan. Approximately 165 cases in the United States and 2 cases in Virginia are reported annually. Tularemia is more common during May-September. Males are affected more frequently than females, and children are affected more than adults.
Natural Reservoir	Small mammals (including voles, rodents, squirrels, rabbits, hares, muskrats, beavers) and various hard ticks. Numerous other wild and domestic animals, including cats, dogs, hamsters, can be affected.
Route of Infection	• Inhalation of dust with infective aerosols (from contaminated soil, grain or hay), or inhalation of organisms from animal carcasses • Bite of infected arthropods (wood, dog and lone star ticks; less commonly in deer flies; and, in other countries, mosquitoes) • Ingestion of contaminated meat, water, soil or vegetation • Contact with contaminated water, soil, vegetation or infectious animal tissues or fluids • Handling sick pet animals or exotic animals
Communicability	• No person-to-person transmission • *F. tularensis* can be found in blood during first 2 weeks of disease and in lesions for a month or more; flies are infective for 14 days and ticks are infective throughout their lifetime (~2 years)
Risk factors	Risk is higher if hunting, trapping, butchering, farming, landscaping, or handling infectious laboratory specimens
Case-fatality Rate	Range <2%–24%, depending upon the strain
Incubation Period	Related to the size of the inoculum; average is 3–5 days (range 1–14 days)
Clinical Description	• There are multiple clinical forms that depend on the transmission route. • Ulceroglandular: most common syndrome; cutaneous ulcer with regional lymphadenopathy; occurs through contact with an infected animal carcass or through an arthropod bite • Glandular: common syndrome; regional lymphadenopathy with no ulcer; occurs through contact with an infected animal carcass or through an arthropod bite • Oculoglandular: uncommon syndrome; conjunctivitis with preauricular lymphadenopathy; occurs with direct contamination of eye • Oropharyngeal: uncommon syndrome; stomatitis, pharyngitis, tonsillitis, cervical lymphadenopathy; occurs through ingestion of contaminated food or water or inhalation of contaminated droplets • Intestinal: intestinal pain, vomiting and diarrhea; occurs rarely, through ingestion of contaminated food or water

	• Typhoidal: uncommon syndrome; febrile illness without early localizing signs and symptoms; used to describe illness in patients with systemic infections without cutaneous or mucosal membrane lesions • Pneumonic: most serious syndrome, typical after intentional aerosol release of organism; primary pleuropulmonary disease; occurs through inhalation of infectious aerosols or secondary to spread in the blood
Differential Diagnosis	Depends upon the clinical manifestations and transmission route
Radiography	• Radiographic findings include patchy subsegmental air space opacities, hilar lymphadenopathy, and pleural effusion. • Earliest findings might be peribronchial infiltrates advancing to bronchopneumonia.
Specimen Collection and Laboratory Testing	• Appropriate specimens include swabs or scrapping of skin lesions, lymph node aspirates or biopsies, pharyngeal washings, sputum specimens, or gastric aspirates, depending on the form of illness. Blood cultures are often negative. • A presumptive diagnosis can be made by direct fluorescent antibody, immunohistochemical staining, or PCR. • A diagnosis can also be established serologically by demonstrating a 4-fold change in specific antibody titers between acute and convalescent sera. Convalescent sera are best drawn at least 4 weeks after illness onset; hence this method is not useful for clinical management. • If tularemia is suspected, notify LHD immediately to discuss the case and laboratory testing. Specimens may be sent to the Division of Consolidated Laboratory Services (DCLS) after VDH has been approved testing. For questions about specimen collection, the DCLS Emergency Officer can be reached 24/7 at 804-335-4617.
Treatment	• Streptomycin is the drug of choice for sporadic cases and gentamicin is an acceptable alternative. During a mass casualty situation (i.e., when intramuscular or intravenous treatment is not available), doxycycline or ciprofloxacin are the preferred choices for treatment. • Additional information on choice of drugs, dosing and duration of treatment is available on the CDC website at https://www.cdc.gov/tularemia/clinicians/index.html and Dennis DT, Inglesby TV, Henderson DA, et al. Consensus Statement: Tularemia as a Biological Weapon: Medical and Public Health Management. JAMA. 2001;285(21): 2763-2773.
Postexposure Prophylaxis	• Doxycycline or ciprofloxacin are the preferred choices for postexposure prophylaxis during a mass casualty situation. • Additional information on choice of drugs, dosing and duration of treatment is available at Dennis DT, Inglesby TV, Henderson DA, et al. Consensus Statement: Tularemia as a Biological Weapon: Medical and Public Health Management. JAMA. 2001;285(21): 2763-2773.
Vaccine	No vaccine available
Infection Control	• Standard Precautions should be used when caring for patients • Laboratory personnel should be alerted when tularemia is suspected • Bodies of patients who die of tularemia should be handled using standard precautions. Autopsy procedures likely to produce aerosols or droplets should be avoided.